DETAILED ACTION

Claim Objections

1. Claims 21 and 22 are objected to under 37 CFR 1.75(c) as being in improper form because they are multiple dependent claims. See MPEP § 608.01(n). Accordingly, the claims 21 and 22 are not been further treated on the merits.

Claim 21 recites (emphasis added) "a data distribution server that communicates with the data reception apparatus according to claim 17 and performs the adaptive control by adopting the adaptive control method according to claim 13". This claim depends from independent claim 17 and independent claim 13.

Claim 22 recites (emphasis added) "a communication system comprising a data reception apparatus according to claim 17 and a data distribution server according to claim 21". This claim depends from independent claim 17 and dependent claim 21, which claim 21 has multiple dependencies by itself.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites, in its entirety, the limitations of:

> *The adaptive control method according to claim 13, wherein:*

the data transmission apparatus counts the number of transmission intervals in which the receiver report packet is not received and compares the counted number with a first threshold;

when the counted number is equal to or greater than the first threshold and a current transmission rate is not a minimum rate, the data transmission apparatus compares the counted number with a second threshold;

when the counted number is not equal to or greater than the second threshold, the data transmission apparatus reduces a transmission rate; and

when the counted number is equal to or greater than the second threshold, the data transmission apparatus ends packet transmission.

In summary, the claimed method relies on or starts from the very fundamental step of "the data transmission apparatus counts the number of transmission intervals in which the receiver report packet is not received". However, it is unclear how long the counting period is. Without a clear and distinct limitation setting forth for the counting period, every other feature in this claim becomes unclear and indistinct because one could count for 1 second or 100 seconds and the result would be totally different. And then it is even more unclear how such drastically different results (1 sec versus 100 sec, for example) can be compared with said "first threshold" and "second threshold", which thresholds, by common sense, would be some fixed values.

Yet there is another ambiguity regarding this claim, which depends from claim 13. Claim 13 states (emphasis added) "before the data reception apparatus receives data distributed by a data transmission apparatus…, reporting the transmission interval from the data reception apparatus to the data transmission apparatus". Therefore, before such "receives data", the "transmission apparatus" supposedly has not sent anything, i.e. it is not known what the data sending rate was for the not-yet-happened transmission. Then questions arise regarding claim 14.

The first question is, when claim 14 states "when the counted number [of not received receiver reports] is not equal to or greater than the second threshold, the data

transmission apparatus reduces a transmission rate", with respect to what previous transmission rate is the current "reduces a transmission rate" performed, knowing that at this point of time nothing has been transmitted, needless to say transmitted at what rate?

The second question comes from the fact that claim 14 also states (emphasis added) "when the counted number is equal to or greater than the first threshold and a current transmission rate is not a minimum rate." Then what is this current transmission rate in view of the fact, again, that at this point of time nothing has been transmitted, keep in mind everything in claim 14 is, as understood, "before" any data is sent from the sender to the receiver.

In summary, it is difficult for one skilled in the art to reconcile the steps of claim 14 in view of claim 13. Applicant is kindly requested to elaborate more on this if the Examiner's observation/interpretation is incorrect.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 13,15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Floyd et al ("Equation-Based Congestion Control for Unicast Applications", SIGCOMM '00, Floyd hereinafter) in view of Yoshimura ("A QoS Control Method of

MPEG Video with an RTP Monitoring Agent for Mobile Streaming Service," The Transactions of the Institute of Electronics, Information and Communication Engineers B, August 1, 2002, Vol. J85-B #8, pp. 1243-1253, Yoshimura hereinafter, of which Applicant provided an English translation of the related part which is applied herein).

Regarding claim 13, Floyd discloses "a viable mechanism to provide relatively smooth congestion control" for real-time traffic (p.43 right col. last two lines) comprising: *an adaptive control method* ("smooth congestion control" cited above, wherein "the sender explicitly adjust its sending rate as a function of the measured rate of loss events", Abstract lines 7-9) *comprising:*

at a data reception apparatus ("the receiver", p.45 left col. 4th paragraph line 1), *determining a transmission interval* ("round-trip time", p.45 left col. 4th paragraph line 2) *to transmit a receiver report packet* ("feedback", p.45 left col. 4th paragraph line 1, and "the round-trip time, R, could be measured at either the sender or the receiver", p.45 left col. 5th paragraph lines 5-6, and further "the receiver should report feedback to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2,);

the data reception apparatus ("the receiver" cited above) *receives data distributed by a data transmission apparatus* ("the sender") *through a communication network and replays audio and video* ("real-time applications (that is where the data [from sender to receiver] is being played out in real-time", p.43 "Introduction" 2nd paragraph lines 4-5);

at the data transmission apparatus ("the sender"), *monitoring the reception of the receiver report packet transmitted from the data reception apparatus in a unit of the*

transmission interval ("the sender obtains the loss event rate p in feedback messages from the receiver at least once per round-trip time", p.45 right col. 2nd paragraph, which requires the sender *monitoring the reception of the receiver* feedback *transmitted* from the receiver *in a unit of the* "round-trip time" because "the receiver should report feedback to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2, noting that "at least once per round-trip time" suggests that it may be more than "once per round-trip time" in which case the *transmission interval* for said "feedback" will be shorter than the "round-trip time"), *and when a consecutive loss of the receiver report packet occurs* ("if the sender has not received feedback after several round-trip times", p.45 left col. 4th paragraph lines 4-5)*, performing adaptive control for a data transmission rate change or a data transmission stop* ("then the sender should reduce its sending rate, and ultimately stop sending altogether", p.45 left col. 4th paragraph lines 5-6).

Regarding claim 17, Floyd discloses *a data reception apparatus* ("the receiver", p.45 left col. 4th paragraph line 1), *comprising:*

a receiver report transmission interval ("round-trip time", p.45 left col. 4th paragraph line 2) *determination section that determines a transmission interval for transmitting a receiver report packet* ("feedback", p.45 left col. 4th paragraph line 1, and "the round-trip time, R, could be measured at either the sender or the receiver", p.45 left col. 5th paragraph lines 5-6, and further "the receiver should report feedback to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2, which, as obvious to one skilled in the art, requires a *determination section* in the receiver to

determine said "round-trip time", or *receiver report transmission interval* as Applicant termed);

a control information transmission and reception section ("the receiver also calculates the loss event loss event rate p and feeds this back to the sender", p.45 right col. 4th paragraph lines 3-4, which requires *a control information transmission and reception section*, as obvious to one skilled in the art) and *the data reception apparatus* ("the receiver" cited above) *receives data distributed by a data transmission apparatus* ("the sender") *through a communication network and replays audio and video* ("real-time applications (that is where the data [from sender to receiver] is being played out in real-time", p.43 "Introduction" 2nd paragraph lines 4-5);

a receiver report packet transmission section that transmit the receiver report packet ("feedback") *at least ones in the transmission interval reported by the control information transmission and reception section* ("the receiver should report feedback to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2, which, as obvious to one skilled in the art, requires *a receiver report packet transmission section* to perform such "report feedback to the sender").

[**Examiner's note**: Floyd in fact also indirectly teaches, regarding both claims, the necessity of *reporting/reports the transmission interval* ("round-trip time" or a time interval shorter than such if more than one "feedback" is to be sent therein) *to the data transmission apparatus.* The indirect teachings of such necessity can be seen from: **a.** more than one "feedback" can be sent in a "round-trip time" because "the receiver should report feedback to the sender at least once per round-trip time". Therefore, in

that case the *transmission interval* will be shorter than the "round-trip time", which needs to be made known to both the sender and the receiver. **b.** the "round-trip time" maybe *determined*/measured by the "receiver" because “the round-trip time, R, could be measured at either the sender or the receiver". Therefore, it follows that when the "round-trip time" is determined by the "receiver", it is necessary as well as obvious that the "receiver" needs to *report* such to the "sender", which is more so in the case wherein more than one feedback is sent, resulting in a shorter feedback interval.]

However, Floyd does not expressly teach, regarding claim 13, *before* above cited user data reception, *reporting the transmission interval from the data reception apparatus to the data transmission apparatus*; regarding claim 17, *before* above cited user data reception, *reports the transmission interval determined in the receiver report packet transmission interval determination section to the data transmission apparatus.*

Yoshimura discloses a QoS control method of MPEG video with a RTP monitoring agent for mobile streaming service comprising:

Regarding claims 13 / 17, *before the data reception apparatus* (“RTP monitoring agent” cited above) *receives data distributed by a data transmission apparatus* (“streaming server”, p.1 2nd paragraph line 6), *reporting* / reports *the transmission interval from the data reception apparatus / determined in the receiver report packet transmission interval determination section to the data transmission apparatus* (“the operation parameter such as feedback interval ... is determined through negotiation as needed between the streaming server and the RTP monitoring agent before starting the streaming session", p.1 2nd paragraph lines 4-7, noting that such “negotiation” will have

to involve *the data reception apparatus*, “monitoring agent”, *reporting the transmission interval*, “feedback interval”, *to the data transmission apparatus*, “streaming server”, in an essentially back-and-forth manner).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Floyd by adding the expressly taught feedback interval reporting steps of Yoshimura (noting that Floyd has implicitly suggested the necessity of doing so, as discussed above) in order to provide a more instantaneous traffic smoothing mechanism that offers better "Quality of Service control" for “mobile streaming services” (Yoshimura, Title).

Regarding claims 15, Floyd discloses *wherein the data reception apparatus* (“receiver”) *determines a maximum interval* ("round-trip time” is the *maximum interval* because "at least one feedback" will be sent therein and any number of feedbacks greater than one will result in *an interval* shorter than the “round-trip time”). Floyd does not expressly but Yoshimua does disclose *reports the determined maximum interval to the data transmission apparatus* ("sender", and see discussion above regarding claim 13, i.e., “feedback interval ... is determined through negotiation as needed between the streaming server and the RTP monitoring agent before starting the streaming session").

Regarding claim 16, Floyd discloses *wherein the data reception apparatus* (“receiver”) *is obliged to transmit the receiver report packet* ("feedback") *at least once in the transmission interval comprising a tolerable maximum interval* (“the receiver should report feedback to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2, wherein the “round-trip time” is *a tolerable maximum interval*

because otherwise an *interval* will be always shorter due to the fact more than one "feedbacks" will be transmitted during the same "round-trip time").

Regarding claims 18, Floyd discloses *wherein the receiver report transmission interval determination section* (the “receiver” must have such a unit because the "receiver" may determine "round-trip time", see discussion above for claim 17) *determines the transmission interval comprising a tolerable maximum interval* ("round-trip time” is *a tolerable maximum interval* because "at least one feedback" will be sent therein and any number of feedbacks greater than one will result in *an interval* shorter than the “round-trip time”) *for transmitting the reception report packet at least once* (“feedback interval ... is determined through negotiation as needed between the streaming server and the RTP monitoring agent before starting the streaming session").

Regarding claim 19, Floyd discloses *wherein a receiver report packet is used for the purpose of adaptive rate control* (“if the sender has not received feedback after several round-trip times, then the sender should reduce its sending rate, and ultimately stop sending altogether”, p.45 left col. 4th paragraph lines 4-6).

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Floyd in view of Yoshimura as applied to claim 13 above, and further in view of Ikeda (US 5,719,853)

Floyd in view of Yoshimura discloses claimed limitations, as discussed in section 5 above. Floyd further discloses, **regarding claim 14**, teachings substantially similar to:

the data transmission apparatus counts the number of transmission intervals in which the receiver report packet is not received and compares the counted number with a first threshold;

when the counted number is equal to or greater than the first threshold and a current transmission rate is not a minimum rate, the data transmission apparatus compares the counted number with a second threshold;

when the counted number is not equal to or greater than the second threshold, the data transmission apparatus reduces a transmission rate; and

when the counted number is equal to or greater than the second threshold, the data transmission apparatus ends packet transmission.

("If the sender has not received feedback after several round-trip times, then the sender should reduce its sending rate, and ultimately stop sending altogether", p.45 left col. 4th paragraph lines 4-6. Although the cited teaching herein appears to be rather concise, it in fact suggests the various elements in claim 14. **a.** the sender has to *count the number of* not-received feedbacks, as directly stated above; **b.** the counting result has to be compared with some predefined thresholds in order to decide at what point , i.e. some threshold value, "the sender should reduce its sending rate", reading on claimed *data transmission apparatus reduces a transmission rate*, and at what other point, i.e. some other threshold value, it should "ultimately stop sending altogether", reading on claimed *data transmission apparatus ends packet transmission*; **c.** the operation of Floyd obviously is subject the condition of the claimed *a current transmission rate is not a minimum rate* because Floyd will further "reduce its sending

rate", meaning there is still room for reducing or previously at *not a minimum rate*, until "ultimately stop sending").

Floyd does not expressly teach subjecting his operation to a *first/second threshold* and *reducing the rate* if between the two thresholds an *stopping transmission* if equal to or above the *second threshold.*

However, in the art of communication rate control, using two different thresholds to regulate or shape traffic is an old and well known technique widely used by those skilled in the art. Ikeda is only one example of many.

Ikeda discloses "congestion control method in a ATM network based on threshold values of node queue length" (Title) comprising:

Regarding claim 14, *when* the counted number (Floyd taught this, see "several round-trip times" cited above) *is equal to or greater than the first threshold* and *not equal to or greater than* (i.e. less than) *the second threshold, the data transmission apparatus reduces a transmission rate* ("when a queue length of a node in a virtual channel set up in an ATM network is a first threshold or more, a source terminal in the virtual channel is instructed to decrease a transmission rate", Abstract lines 1-4) and

when the counted number (Floyd taught this, see "several round-trip times" cited above) *equal to or greater than the second threshold, the data transmission apparatus ends packet transmission* ("When the queue length of a node is a second threshold or more which is greater than the first threshold, there is halted the transmission of data cells from the preceding nodes or source terminals", Abstract lines 4-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the method of Floyd by adding the expressly taught first/second threshold values by Ikeda to Floyd for real-time traffic shaping in order to provide a high efficient system that is "capable of improving a network throughput and availability" (Ikeda, col. 2 lines 18-19).

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Floyd in view of Yoshimura, as applied to claim 17 above, and further in view of Blackard et al (US 5,918,021, Blackard hereinafter).

Floyd in view of Yoshimura discloses claimed limitation as discussed in section 2 above including Yoshimura disclosing *wherein the transmission interval is transmitted* for a *real time streaming* session (“feedback interval ... is determined through negotiation as needed between the streaming server and the RTP monitoring agent before starting the streaming session", p.1 2nd paragraph lines 4-7).

However, Floyd in view of Yoshimura does not expressly disclose that the transmission interval, or "feedback interval", itself is transmitted *using real time streaming protocol or session description protocol*.

Blackard discloses ”data processing system and method for pacing information transfer in a communications network” (Title) using "backchannel (client to server) Pace Message" (col. 6 line 9) comprising:

Regarding claim 20, wherein the transmission interval is transmitted *using real time streaming protocol or session description protocol* ("The client could also set a state within a state machine of the client to forward the Pace Message in another

process. An example of this latter example is the use of a periodic Receiver Report Packet (RRP) specified by the IEFT (Internet Engineering Task Fore) in “RFC 1889,” which defines a RTP (Real Time Protocol) for streaming real-time data over the Internet or another communication network. In this instance, the Pace Message would be embedded in the RTP receiver report”, col. 6 lines 23-31, as such the “Pace Message” or “RRP" is *using* the RTP protocol streaming real-time data).

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify Floyd by adding the backchannel real-time streaming protocol of Blackard to Floyd for transmitting the feedback or receiver report in order to provide more reliable and efficient feedback mechanism that overcomes prior art deficiency wherein “because the sending logic unit is required to wait a certain number of timing cycles until an acknowledgement is received, real-time transfers of data are not easily implemented. When such real-time operations are transmitted, a resulting display at the receiving logic unit fails to provide a true transmission of the desired information" (Blackard, col. 2 lines 32-38).

Response to Arguments

8. Applicant's arguments filed on 3/11/2008 regarding *determining receiver report transmission interval* have been fully considered but they are not persuasive.

9. Applicant argues (Remarks p.7 2nd paragraph) “Floyd does not disclose a receiver that determines … a transmission interval for a receiver report packet".

Examiner respectfully disagrees.

As provided in section 5 above, Floyd clearly discloses said feature by stating (emphasis added) “the round-trip time, R, could be measured at either the sender or the receiver", p.45 left col. 5th paragraph lines 5-6, and said “round-trip time” is the claimed *transmission interval* because “the receiver should report feedback [reading on claimed *receiver report*] to the sender at least once per round-trip time", p.45 left col. 4th paragraph lines 1-2).

For Applicant’s information, determining a feedback transmission interval by a receiver is an old and well known technique in the art. Plenty examples can be found, besides what Floyd has clearly taught as discussed above. For example, US 6,487,689 of Chuah discloses "receiver initiated recovery algorithm (RIRA) for the layer 2 tunneling protocol (L2TP)" (Title) comprising, in view of fig. 6 therein, "The receiver can choose a certain feedback interval (denoted by the variable "feedback interval", or K) for sending such an ACK", col. 6 lines 26-29).

10. Applicant's arguments with respect to independent claims 13 and 17 over *reporting a transmission interval for a receiver report* have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant argues (Remarks p. 7 2nd paragraph) “Floyd does not disclose a receiver that … reports a transmission interval for a receiver report packet”.

This argument is moot because Applicant provided IDS reference of Yoshimura clearly discloses such in that (emphasis added) “the operation parameter such as feedback interval ... is determined through negotiation as needed between the

streaming server and the RTP monitoring agent before starting the streaming session", p.1 2nd paragraph lines 4-7, noting that such "negotiation" will have to involve receiver and sender reporting the "feedback interval" to each other).

12. Applicant's arguments with respect to other references have been considered but are moot in view of the new ground(s) of rejection.

Applicant also argued over previously applied references, such as Suzuki and Schulzrinne (Remarks p.7 and p.8). Although Examiner respectfully disagrees with all those arguments, said arguments are nevertheless moot because Suzuki and Schulzrinne on longer enter the present Office Action.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,487,689 discloses a receiver initiated recovery algorithm wherein feedback transmission interval is determined by a receiver.

US 6,701,372 discloses an invention that can made data communications at an optimal transfer rate on the basis of the unarrived data volume on a network between two end terminals wherein data receiver sends receiver reports to data sender for data transmission rate control purposes.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREW LAI whose telephone number is (571)272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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